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Analysis of anatomy questions asked in Medical Specialization Exams in year 2000 and beyond

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Abstract

This study was carried out to analyze the trends by years in the distribution of subjects in anatomy questions asked in Medical Specialization Exams (TUS) in year 2000 and beyond. Anatomy questions asked in TUS in year 2000 and beyond were examined under basic anatomy and clinical anatomy headings based on the curriculum in medical faculties. A total of 506 anatomy questions, 10 each year until 2012 and 14 each year starting from 2012 spring, were evaluated. The questions were grouped in two as years 2000-2011 and 2012-2021. Of the 506 questions examined, 382 (75.49%) evaluated basic anatomy knowledge, while 121 (23.91%) evaluated clinical anatomy knowledge. It was found that 3 (0.59%) were cancelled by Student Selection And Placement Center (it is called OSYM in Turkey). It was found that 21 (4.22%) of the questions included figures or pictures. All of the questions were examined in terms of systems. Statistically significant increase was found in the number of questions on locomotor system anatomy, circulatory system anatomy, digestive system anatomy and urogenital system anatomy in 2012 and after ($p < 0.05$). It was found that statistically higher number of questions were asked from circulatory, digestive and urogenital system anatomy between the years 2012 and 2021 ($p < 0.05$). Although the number of questions evaluating basic anatomy knowledge decreased after 2012, the number of clinical anatomy questions was about 2 times higher, but this difference was not statistically significant ($p > 0.05$). There is a trend from basic anatomy to clinical anatomy in TUS questions in year 2012 and after. It has been shown that clinical anatomy knowledge in anatomy education given in medical faculties should be increased due to the increasing integration of anatomy with clinical branches.

Keywords: TUS questions, basic anatomy, clinical anatomy, anatomy subjects

Introduction

Anatomy is a visual science that examines the normal shape and structure of the human body, the organs that make up this structure and the relationships of the organs with each other [1, 2]. The science of anatomy has held an important place in medical education throughout history [3]. In *Dissertationes Anatomicae* published in 1656 in Nürnberg, German physician and anatomist Werner Rolfinck showed the importance of anatomy clearly by saying “..Before trying to prevent and treat diseases, physicians first of all should know all parts of the body with its details. Anatomy, the eye of medicine, provides this information. In other words, if not viewed in the light of anatomy, the beginning, foundation and origin of medicine remain in an intense darkness...”[4].

Anatomy education has been blended with clinical information and radiological images in recent years and the aim is to enable students to better understand anatomy and increase their interest in the course [1, 5].

The regulation of specialty education in Turkey was given to the Ministry of Health based on the 9th article of the Law on the Practice of Medicine enacted on April 11, 1928. Entry to specialty education in medicine occurs through a central exam since September 1987.

Medical Specialization Exam (TUS) is an exam to measure knowledge with multiple choice questions, which is carried out by Student Selection and Placing Centre (OSYM) affiliated to the Council of Higher Education (YOK). Although physician have begun to consider TUS as a goal that must be achieved due to the lack of value placed on general practitioners, professional prestige and financial problems, TUS actually should not be considered as a stage that provides the opportunity to specialize in the targeted branch [6-9].

In the literature review, it was concluded that physicians

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receiving specialty education thought knowledge of anatomy can be important, useful and even lifesaving in all branches of medical faculty, especially in departments of radiology, plastic and reconstructive surgery, thoracic surgery, orthopaedics and traumatology, anaesthesiology and reanimation [10].

This study was carried out to analyse the changes by years in the distribution of subjects among questions asked in anatomy branch in TUS in year 2000 and beyond. Thus, it will be possible to find out whether basic anatomy or clinical anatomy questions are asked more and to find out the changes that may have occurred in anatomy questions from the past to the present and which subjects are placed more importance by analysing the questions of anatomy in TUS.

Materials and Methods

A total of 506 anatomy questions asked between 2000 and 2021 were obtained from the official website of OSYM and from books publishing TUS questions [11-13]. 3 of these questions had been cancelled. TUS is held twice a year, in the spring and autumn terms [13]. In the exams held between 2000 and 2011, 10 questions were asked from Anatomy in every semester and 20 questions were asked per year, while after the spring semester of 2012, the number of questions increased to 14 per semester and to 28 per year. The questions were categorized according to years 2000-2011 and 2012- 2021.

All of the questions were analysed under the headings of locomotor system, circulatory system, digestive system, respiratory system, urogenital system, endocrine and nervous system and basic and clinical anatomy.

Statistical Analysis

Two sample t test was used in data which were normally distributed, while Mann Whitney U test was used in data which were not normally distributed. Minitab 17 program was used as statistical program. $p < 0.05$ values were considered as statistically significant.

Results

Of the 506 questions asked in TUS between years 2000 and 2021, 382 (75.9%) were in the field of basic anatomy, while 121 (24.1%) were in the field of clinical anatomy (Table 1). It was found that the remaining 3 questions were cancelled. Cancelled questions were not included in the statistical analysis. 21 (4.2%) questions were found which included figures or pictures.

Table 1. The number of questions and percentages in basic and clinical anatomy between the years 2000-2011 and 2012-2021.

Topics	TUS years	mean*	min*	median*	max*	sum	%
Basic Anatomy	2000-2011	8	5	8	10	197	75.9
	2012-2021	9	1	11	14	185	
Clinical Anatomy	2000-2011	1	0	2	5	43	24.1
	2012-2021	4	0	3	13	78	

(*: It shows the number of questions in a period.)

When all the questions were examined in terms of systems, it was found that there were 188 (37.4%) questions from locomotor system, 72 (14.3%) questions from circulatory system, 36 (7.1%) questions from respiratory system, 64 (12.7%) questions from digestive system, 28 (5.6%) questions from urogenital system, 115 (22.9%) questions from nervous system, while there were no questions from endocrine system anatomy between these years (Table 2).

Table 2. The number of questions between years 2000-2011 and 2012-2021 according to subjects and their distribution by systems

Topics	TUS years	mean*	min*	median*	max*	sum	%
Locomotor System	2000-2011	3	2	4	6	91	37.4
	2012-2021	5	2	5	8	97	
Circulatory System Anatomy	2000-2011	1	0	1.5	3	33	14.3
	2012-2021	2	0	2	4	39	
Respiratory System Anatomy	2000-2011	0.7	0	0.5	3	17	7.1
	2012-2021	1	0	1.0	2	19	
Digestive System Anatomy	2000-2011	1.2	0	1	3	29	12.7
	2012-2021	1.8	0	2	4	35	
Urogenital System Anatomy	2000-2011	0.5	0	0	2	12	5.6
	2012-2021	0.8	0	1	1	16	
Endocrine System Anatomy	2000-2011	0	0	0	0	0	0
	2012-2021	0	0	0	0	0	
Nervous System Anatomy	2000-2011	2	1	2	6	58	22.9
	2012-2021	3	1	3	6	57	

(*: It shows the number of questions in a period.)

Statistically significant difference was found when the number of questions on locomotor system anatomy, circulatory system anatomy, digestive system anatomy and urogenital system anatomy were compared between years 2000-2011 and 2012-2021 ($p < 0.05$). It was found that statistically higher number of questions were asked from circulatory, digestive and urogenital system anatomy between the years 2012 and 2021 ($p < 0.05$). Although more questions were asked from locomotor system anatomy between the years 2012 and 2021, the rate was found to be lower since the number of anatomy questions had increased in general. No significant difference was found in respiratory and nervous system anatomy between the years. It was found that there were no questions from endocrine system anatomy (Table 3).

Table 3. Normal distribution test results by years between the years 2000-2011 and 2012-2021

Topics	2000-2011 number of question	2012-2021 number of question	pMWU
Locomotor System	91 %37.9	97 %36.9	0.01
Circulatory System Anatomy	33 %13.7	39 %14.8	<0.05
Respiratory System Anatomy	17 %7.1	19 %7.2	0.12
Digestive System Anatomy	29 %12.1	35 %13.3	0.03
Urogenital System Anatomy	12 %5	16 %6.1	0.04
Endocrine System Anatomy	0 %0	0 %0	0
Nervous System Anatomy	58 %24.2	57 %21.7	0.16
Total	%100	%100	

Although there were more questions on basic anatomy knowledge before 2012, this rate was found to decrease after 2012. It was found that the questions on clinical anatomy knowledge were asked about two times more after 2012. However, this difference was not significant ($p>0.05$) (Table 4). When basic anatomy and clinical anatomy were compared, it was found that basic anatomy questions were asked statistically significantly more ($p<0.05$).

Table 4. Mann Whitney U test results between the years 2000-2011 and 2012-2021 by topics

Topics	2000-2011	2000-2011	PMWU
Basic Anatomy	197 %82.1	185 %70.3	0.06
Clinical Anatomy	43 %17.9	78 %29.7	0.11
Total	240 %100	263 %100	

Discussion

This study was conducted to examine the changes in subject distributions of questions asked in TUS anatomy branch in 2000 and after. In the study, it was found that the highest number of questions was from locomotor system, followed by nervous, circulatory, digestive, respiratory, urogenital system anatomy, respectively; while there were no questions from endocrine system anatomy. With the increase in the rate of anatomy questions starting from 2012, although it was found that basic anatomy questions were asked more frequently than clinical questions, it was also found that the number of questions on clinical anatomy knowledge increased remarkably.

In the Edinburgh Declaration, which was issued in 1988 and which is a turning point in determining the purpose of medical education, it was reported that the one thing that would bring people's health to better levels was educating good physicians [14, 15]. The way to being a good physician is to know anatomy, which is one of the cornerstones of medicine, well [1, 14]. While performing the

physical examination of the patient, it is a must to know anatomy to make a correct diagnosis and to give the appropriate treatment [10, 14]. There are studies conducted in literature about the importance of knowing anatomy [16, 17].

Although the fact that this is the first study in literature making a systematic analysis of anatomy in TUS questions will limit the discussion, it will form a basis for future studies.

In a study Uygur et al. conducted to find out which systems medicine students learned more easily and which ones they learned more difficult, they found that students generally knew about general anatomy subjects, while they had difficulty in learning nervous system anatomy [18]. As a result of the analysis of TUS questions in the present study, it was found that the highest number of questions was from locomotor system, while the lowest number of questions was from urogenital system.

Since anatomy is a visual science, it has been found that especially recently, classical anatomy books include clinical anatomic problems and radiological images [1]. In this study, according to the analysis made, it was found that there were more clinical anatomy questions, especially recently. There were also anatomy questions with radiological images in visual questions which were recently asked in TUS. In a study conducted in literature on the place and necessity of clinical anatomy courses, it was concluded that clinical and radiological anatomy facilitated the comprehensibility of basic anatomy knowledge, increased students' motivation and reinforced the information learned [1]. In another study, it was stated that as clinical education progresses, it will strengthen the knowledge of anatomy [19]. In a study they evaluated student views about anatomy education, Uygur et al. reported that students were happy they were taught clinical anatomy [18].

It is important for physicians who complete their medical education to diagnose patients who come to the clinic and to analyse them to prepare for their future professional lives [1]. It is also important for rotation to be obligatory especially for plastic surgery department in anatomy medicine residency training. In a study they conducted, Kandemir et al. concluded that integrating anatomy education with the specialty area will make physicians' professional lives better [10]. Thus, the importance of anatomy was shown not only in medical education, but also in specialty education.

Education is a process and stagnation is not in its nature [20]. Today, World Federation of Medicine Education (WFME) aims for universal standards in basic and quality developing criteria in medicine and specialty education [10]. In order to increase the quality of both medical and specialty education, deficiencies should be determined, and solutions should be provided through guidance. As a result, the present study emphasizes that medical education should include not only basic anatomy but also clinical anatomy with basic anatomy. There are studies supporting our results in literature [1, 14, 18].

Conclusion

We believe that the results obtained from regulations related with education will keep education up-to-date and be a guide. Clinical information integrated with basic anatomy knowledge will both

have a memorable place and will provide convenience in preparing students for their professional life and solving possible clinical problems. The fact that TUS questions of the last 10 years also showed such a trend will give an idea about updating the courses on anatomy sub-branches and integrating these to clinic.

Note: This study was presented at 1st International Dr. Safiye Ali Multidisciplinary Studies Congress in Health Sciences on August 6-7, 2021

Conflict of interests

The authors declare that they have no competing interests.

Financial Disclosure

All authors declare no financial support.

Ethical approval

This study is only a research on TUS questions.

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